

number of NATURE as having been seen by Mr. Denning at Bristol on the evening of the 23rd ult., as well as a single other shooting star noted during a watch of the sky whenever it was clear by the same observer on that evening, seem, from their apparent courses, to have been both possibly directed from the now well-known radiant point of the meteors of Biela's comet, but only a small number of shooting stars appears to have been visible on that night. During a watch for ten minutes, kept at four different times between half-past 7 and half-past 9 P.M. on the following evening, near Regent's Park, in London, Mr. H. W. Jackson observed, in each watch, a shooting star as bright as a first-magnitude star directed in each case from the recently determined radiant point; while, with an equally uncloudy sky, on the following evening of the 25th, three small meteors from the same radiant point, and two brighter ones from other directions, were seen by Mr. Denning at Bristol between 8 and 11 P.M. in two intervals of a watch for half an hour. A small meteor of the same stream was recorded by Mr. Denning on the 26th, but their numbers on this, as on the previous nights, were evidently inconsiderable, a clear view of the sky on the night of the 26th, between 11h. 20m. and 12h. 40m., affording Mr. Jackson, at Tooting, no observation of a single meteor. The time of first approach and commencement of the bright star-shower seen on the evening of the 27th ult. must therefore have been later than shortly before 1 o'clock on the previous morning. A completely overcast state of the sky after midnight on the night of the shower appears to have prevented observations of its close, and probably of its complete extinction on that night, after the greatly-diminished intensity which it had then attained; but a correspondent in London informs me that, in spite of the densely overcast state of the sky, which prevented any view of the shower from being obtained in the metropolis, an exceedingly bright meteor was seen to flash like lightning through the clouds at about 4 o'clock, A.M., on the 28th. On the evening of the 28th Mr. Greg watched for shooting stars, and for any remnants of the star-shower of the previous evening which might be visible, at Buntingford, in Hert's; but although the sky was quite clear he failed to see any meteors. A strict watch for outlying meteors of the shower was also kept by two observers at Hawkhurst, in Kent, on the evening of the 28th, where the sky was quite cloudless between 9h. and 11h. 15m. P.M., but without success, only four shooting stars of ordinary character being visible during more than two hours of their simultaneous watch. An interval of about forty-four hours is thus clearly determined in which the first indications of the star-shower must have arisen, reaching the maximum of its intensity towards the middle of the period, and disappearing so completely before its termination as to leave the whole expanse of the sky almost as perfectly free from shooting stars as it was before its commencement.

In addition to the early appearance of the shower recorded in NATURE of the 5th inst. as having been seen near Dublin, I have received the following communications from observers relating to its early visibility and abundance. At Brancepeth, near Durham, Mr. Joseph Lawson first began to count the meteors at 5 o'clock, and continued to enumerate them until, towards 7 o'clock, their constantly increasing frequency obliged him to desist. During the last half hour of his estimation the rate of their appearance was about ten per minute, while a total number of 1,000 meteors was counted between 5 and 7 o'clock. The rate of their appearance in the first was thus little less than that of their appearance in the latter portion of his watch. Mr. S. J. Miller, at Wisbeach, first noticed the abundance of shooting stars at 5h. 40m., and counted in three minutes twenty meteors, or about six or seven per minute. Soon after this, at about 6 o'clock, their number was ten or twelve per minute. During their appearance before 6 o'clock, Mr. Wood, at Birmingham, considered them to be falling from 5h. 45m. when he first observed them, at a rate of about fifteen per minute, while the result of his enumeration between 6h. and 7h. was at least 600 meteors, and in occasional intervals between 6h. and 7h. 15m., when the sky became gradually overcast, the average rate of appearance was found to be increasing nearly uniformly from 8 to 10 per minute, showing that the intensity of the display before 6 o'clock was little inferior to the maximum which it appears afterwards to have gradually attained. At York the first attempt to estimate their numbers was made by Mr. T. H. Waller, at 5.30 o'clock, when the meteors were found to be appearing at the rate of 12 or 15 per minute. At 6 o'clock their numbers had increased to about

20, and at 7 o'clock to about 30 or 40 per minute for one observer. At 8 o'clock the best determination of their numbers was however obtained by two of Mr. Waller's scholars, who, standing back to back, counted 79 meteors in 1m. 15s. or 31 meteors per minute for each observer. The principal maxima of the shower at about 6h. 30m., and 8h. 15m. P.M., as mostly clearly shown by the continuous observations of Mr. Lowe at Highfield House, and by Prof. Grant, who was assisted in his observations at the Glasgow Observatory by Prof. G. Forbes, are also generally indicated by the observations which I have received, and the gradual diminution of the shower after 9 o'clock was observed at Newcastle-upon-Tyne as well as by some of the observers who combined in their watch for its appearance for the British Association. The frequency of the meteors after 9 o'clock was regarded by Mr. Wood as not more than a quarter of what it was at about 6 o'clock, when they were first seen, yet these numbers continued for some time to be considerable and quite unusual. Near Rothbury, in Northumberland, repeated estimations of their abundance were made by Mr. G. A. Lebour in different parts of the sky, and at different times between the hours of 7 and 10 o'clock, with the following results:—

From 7 ^h 20 ^m to 7 ^h 28 ^m	100 meteors falling perpendicularly in the west (the east cloudy).
7 35 7 40	100 meteors falling vertically in the east (the west cloudy).
7 45 7 48	100
9 0 9 15	Meteors too numerous to count at 9h., falling in showers at 9h. 15m., especially in the north; one bright red with beautiful red streak, which lasted more than 10 seconds.
10 0	Meteors still falling, but in smaller numbers.

In 20 minutes after 10 o'clock 35 meteors were seen by one observer in a clear part of the sky, which scarcely exceeded a quarter of the sky. In 10 minutes after 11 o'clock ten meteors only were counted in the same space, and in 20 minutes after 12 o'clock 9 meteors only could be seen. The rate of decrease of the shower from shortly before 10 o'clock until after midnight was thus apparently more rapid, and the decline of its intensity appears to have been considerably more complete than the first brightness and progress of its gradual increase may be concluded to have been during the earliest hours of its observation.

Newcastle-upon-Tyne, Dec. 7

A. S. HERSCHEL

The De Novo Production of Living Things

WILL you allow me to ask Dr. Bastian to state in your columns, in reply to this note, the specific gravity of the turnip infusion, to which a "fragment" of cheese has been added, and which, he states, has rarely failed to give him positive results in his endeavours to obtain evidence of the *de novo* production of living things from dead matter. If Dr. Bastian should be unable to give the specific gravity of the infusion, perhaps he will be so good as to state accurately the weights of water, turnip, and cheese employed. I am, of course, acquainted with the directions he has already given, but wish to avoid any objection from him or others on the score of improper preparation of the infusion to results which I may obtain and publish.

E. RAY LANKESTER

Exeter College, Oxford, Dec. 7

The Birth of Chemistry

YOUR correspondent, "A. H.," in alluding to my mention of the *Insula Cassiterides*, inquires whether the name was derived from a Sanskrit source. The word *kaṣṭīreṣas* is used both by Homer and Hesiod, and it is possible that it may have been borrowed from the Sanskrit *kaṣṭīra*, and that tin was first procured from India. The Sanskrit word for tin—*kaṣṭīra*—is clearly related to the verb *kāś*, to shine. It is strange that the Arabic word for tin is *kaṣṭīr*, closely resembling the Sanskrit, although there is no family relationship between the languages. Possibly the Phœnicians first procured tin from India, and gave it a name resembling its native name *kaṣṭīra*; then the Greeks converted the Phœnician word into *kaṣṭīreṣas*, the Romans borrowed the word from the Greeks, and the fact of the scarce

metal being found in certain islands north of Spain was sufficient to secure for them the distinctive title of *Insula Cassiterides*, or Tin Islands.

G. F. RODWELL.

The Greenwich Date

UNDER this heading, in your number for Nov. 28, a letter signed "James Pearson" ends thus:—"The query then is—in what part of the globe and in what meridian does October 20 end and October 21 begin?" As well ask where a circle ends and where it begins. See an article at the end of Bayle's Dictionary, entitled, in the second Rotterdam edition, 1702, "Dissertation sur le jour," vol. iii. p. 3118; in the London edition, 1741, "Dissertation concerning the Space of Time called Day," vol. x. p. 365. The difficulty, as Bayle shows, is in the nature of things. Let an equatorial railroad go round the world in twenty-four hours, with a station at every 45th meridian. At noon of October 20, Mr. West takes "a return ticket" westward; Mr. East takes one eastward. Both reckon by solar time. At every station Mr. West finds it noon, and on his return home reckons noon October 20; but the station-master reckons noon October 21. Mr. East at 45° sees the sun set at 6 o'clock. At 90° he finds midnight; at 135° the sun rises at 6 o'clock on October 21; at 180° it is noon. Here the two passengers pass each other, Mr. West reckoning it to be noon of October 20, Mr. East noon of October 21. At 135° W., Mr. East sees the sun set; at 90° he finds midnight; at 45° the sun rises at 6 o'clock on October 22. On his return home Mr. East reckons it to be noon of October 22. Here then are three different reckonings, and practically the keeping of Sunday, Christmas Day, &c., on different days in different countries exists at this instant and must exist for ever. Practically also those who sail eastward round the world get one more dinner than those who stay at home. Those who sail westward round the world get one dinner less than those who stay at home, and two dinners less than those who sail eastward, when both voyages are completed.

GEORGE GREENWOOD

Brookwood Park, Alresford, Nov. 30

MR. PEARSON'S query, in NATURE of November 28, does not admit of any exact or scientific answer, for there is no natural line of demarcation or change, and the settlement is entirely a matter of usage or convenience. It is not very many years since the dates at Manila and Macao were different; and till the cession of the Alaska Territory to the Americans, the date there was different from that in the British Territory adjoining. The rule now generally held is, that places in E. long. date as if they were arrived at by the Cape of Good Hope, and places in W. long. as if they were reached *via* Cape Horn—a rule that the width of the Pacific renders practically convenient. Afloat, the rule is for a ship making a passage to change her date on crossing the meridian of 180°, or as soon after as the captain may find convenient; repeating or omitting a day, according to the direction in which she is going; but a ship merely cruising across the meridian, with the intention of returning, does not generally change her date, so that ships having different dates may and do occasionally meet—a very marked instance of which occurred during the Russian war, when our squadron from the Pacific joined the China squadron on the coast of Kamschatka.

And thus, according to established usage, October 21 at Adelaide, and October 21 at the hypothetical place in 9h. 35m. W. long., are different days; in the two places October 21 has a different meaning.

J. K. LAUGHTON

Royal Naval College, Dec. 1

THE Rev. J. Pearson is correct in the method of finding the corresponding Greenwich date, although its numerical performance is incorrectly performed in his letter.

It is absolutely necessary for practical purposes to draw the line somewhere, and it is drawn in England at her colonies as well as in America and Russia, at the meridian 180° E. of Greenwich. The limit, therefore, of the longitude to be added to or subtracted from the Greenwich date will not exceed twelve hours.

It is usual for sailors, when crossing this meridian, to skip a day, or to reckon the same day over again, according as the meridian has been reached from the eastward or westward.

An instance of this apparent anomaly is furnished in the Appendix to the "Nautical Almanac" for 1874. The time of the phenomenon of the transit of Venus over the sun's disc takes place generally about December 8, 16h. Greenwich astronomical time. Its recorded local astronomical time for the middle of the transit at Auckland, New Zealand (long. 174° 42' E.), is December 9, 3h. 40m.; but for Woahoo (long. 158° W.) the time of the first contact of Venus with the sun's limb takes place at December 8, 3h. 47m.

EDWARD ROBERTS

Blackheath Road, Greenwich, Dec. 2

Comets' Tails

CAN any of your readers refer me to a work by a recognised authority in astronomy in which I can find the method by which the direction of a comet's tail, as regards that of the heliocentric radius-vector of the head, has been calculated from observation? Or, more briefly, have we any *proof whatever* that there is other than an occasional chance coincidence of these two directions?

G. H.

REMARKS ON THE ZOOLOGY OF THE FAROE ISLANDS

AS I have already announced in this paper, I started with the Danish expedition in September from Copenhagen, and arrived after a very fortunate voyage of four days in Torshavn, the little capital of Faroe in the isle of Strömö. There I intended to remain while our steamer, with the geologists and engineers, went to the southern island (Suderö), where the miocene coal deposits are to be seen some hundred feet above the level of the sea in the basaltic rocks near the village of Qualbö. As to their researches about the extension of the coal-fields in Suderö, directed by Prof. Johnstrup, and as to the possibility of taking the coals over to Copenhagen at a reasonable price, I cannot say anything now, as the report must first be made to the Minister of the Interior, who will perhaps afterwards publish the results. Some words, however, about my own zoological researches in Torshavn will, I think, have some interest for the readers of NATURE.

I remarked in my preceding paper that no wild mammals were known to occur in the islands, except some species of the genus *Mus*. This is, as I now know, not quite correct; for some thirty or forty years ago the northern hare (*Lepus alpinus*) was introduced into the islands, and it seems to have met with very favourable conditions of life, as it is now spread in considerable numbers over Strömö, and has also been brought to Oesterö. The hare finds ample food in the grasses covering the ground; the large rocks spread everywhere protect him, and no mammals or birds of prey endanger his life, with the exception of *Corvus corax*, or the little *Falco aescalon*, which sometimes might take the younger ones. The occurrence of the *Falco islandicus* is too rare to do any serious damage to the hares. Besides these, they have also endeavoured to introduce the "rippers" (*Tetrao lagopus*) so common in Iceland and Norway, but those set free have perished without breeding. These birds require food and protection from trees, which, as it is known, do not occur in these islands.

The rats found in the northern islands of Faroe (although they have not yet come to all the islands) belong to the species *Mus decumanus*, which here, as nearly everywhere in Europe, has nearly destroyed the smaller black rat (*Mus rattus*), still, however, to be found in some houses of Suderö. In the "fields" still another species of rat is said to occur, not heretofore seen by naturalists. Mr. Randrop of Torshavn, who has taken great trouble in order to secure a specimen of the animal, the footprints of which he has seen, thinks it is the *Lemmus norvegicus*, but he could never get it. Among the large aquatic mammals the "Grindehval" (*Delphinus globiceps*) is known to be of great importance here, as nearly every year large flocks of it are taken, which they drive to the